

Doc Code: AP.PRE.REQ

PTO/SB/33 (07-09)

Approved for use through 07/31/2012. OMB 0651-0031

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## PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

2729-0117PUS1

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on \_\_\_\_\_

Signature \_\_\_\_\_

Typed or printed  
name \_\_\_\_\_

Application Number

10/590,727

Filed

August 25, 2006

First Named Inventor

Kazuto NAGATA

Art Unit

1621

Examiner

KATAKAM, S.

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

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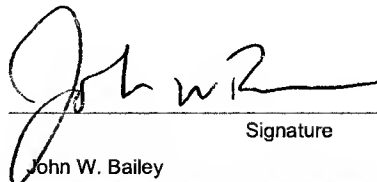
☐ applicant/inventor.

☐ assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.  
(Form PTO/SB/96)

☒ attorney or agent of record.  
Registration number 32881

☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

  
Signature

John W. Bailey

Typed or printed name

703-205-8000

Telephone number

AUG 22 2011

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.  
Submit multiple forms if more than one signature is required, see below\*.

☐ \*Total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Patent Application of:

Kazuto NAGATA et al.

Application No.: 10/590,727

Confirmation No.: 2537

Filed: August 25, 2006

Art Unit: 1621

For: POLYACENE COMPOUND AND ORGANIC  
SEMICONDUCTOR THIN FILM

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Examiner: KATAKAM, S.

**ARGUMENTS IN SUPPORT OF PRE-APPEAL BRIEF REVIEW**

**MS AF**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In response to the Final Office Action dated April 22, 2011, Applicants respectfully request a pre-appeal brief conference. This request is being concurrently filed with a Notice of Appeal.

**Status of the Claims**

Claims 1-2, 5-6, 9-11, 14-15, 18-21, and 34-35 are pending in the above-identified application. Applicants request withdrawal of the rejection of record as being clearly erroneous in fact and in law for the reasons set forth below.

**Issues under 35 U.S.C. § 103(a)**

Claims 1-2, 5-6, 9-11, 14-15, 18-21, and 34-35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minakata '010 (US 7,061,010), Nanpo '719 (JP 2004-158719), and Levinson et al. '933 (WO 2000/056933) (paragraph 7 of the outstanding Office Action).

Applicants respectfully traverse. Reconsideration and withdrawal of this rejection are respectfully requested based on the following considerations.

*Distinctions over the Cited References*

On page 7 of the Office Action dated December 15, 2010, the Examiner alleged, “The alkyl groups are prone to oxidation, whereas F or Cl increases the solubility, and therefore, replacing alkyl with F or Cl will make the compound with improved solubility and oxidation resistance.”

In response, Applicants argued that the present invention is not related to “replacing” alkyl with F or Cl. The present invention is related to a polyacene compound having both an alkyl group and a halogen group. The Examiner does not appear to respond to this argument in the outstanding Office Action.

On page 3, lines 12-15 of the outstanding Office Action, the Examiner asserts that “all the claimed elements were known in the prior art and one skilled person in the art could have combined the elements as claimed by known methods with no change in their respective functions.” Applicants traverse.

A polyacene compound, as claimed in the present invention, having halogen groups introduced at the minor axis ends and alkyl groups introduced at the major axis ends, instead of “replacing” alkyl group with F or Cl, is not achievable by any combination of the cited references. In addition, the present invention makes it possible to improve both the solubility in solvents and the oxidation resistance. Such objects are not disclosed or suggested by any of the cited references. In other words, all the elements of the present invention are not disclosed.

Even if all of the elements of the present invention are disclosed, one of ordinary skill in the art would have no reason or rationale for combining the cited references. In the present invention, a polyacene compound is claimed having a structure with halogen groups introduced at the minor axis ends and alkyl groups introduced at the major axis ends, whereby both the solubility in solvents and the oxidation resistance are improved.

In contrast, the object of Minakata ‘010 is a defect-free semiconductor thin film with high crystallinity at a low cost (col. 1, lines 63-67). The object of Nanpo ‘719 is a defect-free organic semiconductor thin film superior in planarity (paragraph [0016]). The object of Levinson et al. ‘933 is to provide highly stable and rigid structures to ensure low reactivity with neighboring molecules, a sharp absorption band and high quantum yields (page 3, line 6 from the bottom).

Accordingly, the objects of the claimed invention are novel, thereby making it difficult to combine the elements respectively disclosed by the cited references. Since the Examiner had not made a prima facie obviousness due to the lack of evidence supporting a “reasonable expectation of success,” it is difficult to make a polyacene compound that improves both the solubility in solvents and the oxidation resistance. See *Example 4.1, In re Omeprazole Patent Litigation* on Page 53646 on Combining Prior Art Elements in “Examination Guidelines Update: Developments in the Obviousness Inquiry After KSR v. Teleflex,” Federal Register, Vol. 75, No. 169.

As stated above, the present invention is directed to a polyacene compound having halogen groups introduced at the minor axis ends and alkyl groups introduced at the major axis ends and is not related to “replacing” alkyl with F or Cl. None of the cited references specifies where halogen groups are introduced, and none of the cited reference discloses or suggests the improvement in both the solubility in solvents and the oxidation resistance.

On page 7 of the Office Action dated December 15, 2010, the Examiner asserted that the results in the previously submitted Rule 132 Declarations would be expected.

On page 3, lines 15-20 of the outstanding Office Action, the Examiner asserts that “the combination would have yielded predictable results to have yielded predictable results to one of ordinary skill in the art at the time of the invention. In case of instant claims, applicants introduced two halogens on the same ring of alkyl-substituted polyacene. First, the above cited prior art reads applicants claims. Second, the prior art also further established the properties can be altered by modifying the substitutions, so that to make the desired organic semiconductor.”

The Examiner does not appear to have considered the Rule 132 Declaration submitted on October 14, 2010. Even if Cl has electron withdrawing properties, these properties merely suggest the improvement in the solubility but does not exhibit the tendency in the oxidation resistance. None of the cited references discloses or suggests the effect of improving both the oxidation resistance and the solubility in solvents by introducing halogen groups at the minor axis ends with alkyl groups introduced at the major axis ends in a polyacene ring. Accordingly, the present invention produces unexpectedly superior results over the cited references.

On page 3, lines 1 to 4 of the outstanding Office Action, the Examiner relies on Minakata '010 to disclose at col. 3, lines 28-65 that the properties of polyacene can be altered by introducing a functional group on the ring.

Minakata '010 has an object of a defect-free semiconductor thin film with high crystallinity at a low cost (col. 1, lines 63-67), which is different from the present invention. Minakata '010 discloses, "The derivatives in Group 1 have functional groups only at the substitution positions in the long-axis direction, and the derivatives in Group 2 have functional groups only at the substitution positions in the short-axis direction. These derivatives are preferable since they enable high solubility in organic semiconductor thin films" (col. 3, lines 16-22). Further, Minakata '010 discloses, "However, it seems to be because carrier transport is likely to be blocked by functional groups if a polyacene has functional groups at the substitution positions in both the long and short-axis directions as in those in Group 3, since molecules of a polyacene are in stacked form in a thin film" (col. 3, lines 22-27).

In this regard, the present invention would fall under Group 3 since the polyacene compound of the present invention has functional groups at the substitution positions in both the long- and short-axis directions. As such, Minakata '010 actually teaches away from the present invention. The other cited references do not refute this teaching. See *Example 4.2, Cros, Inc. v. U.S. International Trade Commission* on Page 53647 on Combining Prior Art Elements in "Examination Guidelines Update: Developments in the Obviousness Inquiry After *KSR v. Teleflex*," Federal Register, Vol. 75, No. 169.

As stated on page 3, lines 5-11 of the outstanding Office Action, Applicants agree that "a methyl group is electron donating properties, whereas F or Cl has electron attracting properties on a polyacene ring. Alkyl groups on the polyacene ring are prone to oxidation." However, none of the cited references discloses or suggests that halogen groups (F or Cl) having electron attracting properties are introduced at the minor axis ends in order to suppress the oxidation tendency of alkyl groups on the polyacene ring. In fact, none of the cited references discloses or suggests the compound having both of alkyl groups and halogen groups (F or Cl), and none of the cited references discloses or suggests that the oxidation resistance of a polyacene ring is improved by introducing halogen groups (F or Cl) at the minor axis ends of the polyacene ring. Moreover, none of the cited references discloses or suggests that the oxidation resistance is also improved even if a polyacene ring has electron attracting properties.

To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be disclosed by the cited references. As discussed above, Minakata '010, Nanpo '719, and Levinson et al. '933 fail to disclose all of the claim limitations of independent claims 1 and 10, and those claims dependent thereon. Accordingly, the combination of references does not render the present invention obvious.

Furthermore, the cited references or the knowledge in the art provide no reason or rationale that would allow one of ordinary skill in the art to arrive at the present invention as claimed. Therefore, a *prima facie* case of obviousness has not been established, and withdrawal of the outstanding rejection is respectfully requested. Any contentions of the USPTO to the contrary must be reconsidered at present.

Dated: August 22, 2011

Respectfully submitted,

By 

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